

missible. This is true whether the step completely changes a reliable methodology or merely misapplies that methodology.

Evidence > Witnesses > Expert Testimony

[HN19] Fed. R. Evid. 702's third requirement -- that the evidence is relevant or "fits" under the facts of the case -- also must be satisfied before an expert's proffered testimony may meet the Daubert test.

Torts > Causation > Cause in Fact

[HN20] Establishment of causation hinges either (1) on experimental evidence from humans or an appropriate animal model, or (2) more frequently, on observational human evidence ascertained through epidemiological studies.

Evidence > Witnesses > Expert Testimony

[HN21] Fed. R. Evid. 703 is satisfied once there is a showing that an expert's testimony is based on the type of data a reasonable expert in the field would use in rendering an opinion on the subject at issue.

Evidence > Procedural Considerations > Preliminary Questions

Evidence > Witnesses > Expert Testimony

[HN22] It is the judge who makes the determination of reasonable reliance, and that for the judge to make the factual determination under Fed. R. Evid. 104(a) that an expert is basing his or her opinion on a type of data reasonably relied upon by experts, the judge must conduct an independent evaluation into reasonableness. Of course, the judge can take into account the particular expert's opinion that experts reasonably rely on that type data, as well as the opinions of other experts as to its reliability, but the judge can also take into account other factors he or she deems relevant.

Torts > Causation > Cause in Fact

[HN23] Epidemiology cannot prove causation; causation is a judgment issue for epidemiologists and others interpreting the epidemiological data.

Evidence > Witnesses > Expert Testimony

[HN24] The Daubert analysis under the "fit" or helpfulness requirement of Fed. R. Evid. 702 necessitates a valid scientific connection to the pertinent inquiry as a prerequisite for admissibility. "Fit" is not always obvious, and scientific validity for one purpose is not necessarily scientific validity for other, unrelated purposes.

Evidence > Witnesses > Expert Testimony

[HN25] An expert's testimony regarding general causation is admissible, where there is a connection between

the scientific research or test result to be presented, and particular disputed factual issues in this case.

Evidence > Witnesses > Expert Testimony

[HN26] Most of the Daubert factors -- testability, general acceptance, peer review, and degree of production of errors, are of only limited help in assessing whether the methodology of a physician is reliable, i.e., scientifically valid. Instead, courts must consider whether: either (1) the doctor engaged in very few standard diagnostic techniques by which doctors normally rule out alternative causes and the doctor offered no good explanation as to why his or her conclusion remained reliable, or (2) the defendants pointed to some likely cause of the plaintiff's illness other than the defendants' actions and the doctor offered no reasonable explanation as to why he or she still believes that the defendants' actions were a substantial factor in bringing about that illness.

Evidence > Witnesses > Expert Testimony

[HN27] In its determination of whether a witness may be considered as an expert, the court must compare the area in which the witness has superior knowledge, skill, experience, or education with the subject matter of the witness's testimony. Moreover, while an expert may give his opinion on a particular matter within the scope of his expertise, that opinion must be based on facts.

Evidence > Witnesses > Expert Testimony

[HN28] An expert opinion must be based on facts, rather than premised on unsupported assumptions and speculation.

Civil Procedure > Pleading & Practice > Defenses, Objections & Demurrers > Motions to Dismiss

Torts > Products Liability > Breach of Warranty

[HN29] On a motion to dismiss, as opposed to summary judgment, a plaintiff must only show some evidence of a defect.

Civil Procedure > Pleading & Practice > Defenses, Objections & Demurrers > Failure to State a Cause of Action

[HN30] A complaint will only be dismissed for failure to state a claim if under no set of facts which could be proven to support the claim asserted would plaintiff be entitled to relief.

Torts > Products Liability > Negligence

[HN31] In a negligence case under Delaware law, a plaintiff must establish a duty, breach of that duty, proximate cause and damages. These elements must be established by a plaintiff in both "defective design" and "duty to warn" claims in a product liability action. Proof

that a product is defective necessitates more than merely showing that the product brought about an injury.

Torts > Products Liability > Negligence

Torts > Products Liability > Breach of Warranty

[HN32] Under New Jersey law, in order for a plaintiff to establish a design defect, he must prove that the product was not reasonably fit, suitable or safe for its intended purpose because it was designed in a defective manner. A "risk-utility analysis" must be applied, with the result that a manufacturer is held liable only if the danger posed by the product outweighs the benefits of the way the product was designed and marketed. In other words, to establish a product defect under New Jersey law, proof of either a design defect, a manufacturing defect or an inadequate warning defect, which renders the product unfit, unsuitable or unsafe for its intended or prescribed purpose must be established. Similarly, in Delaware, a product is defective in design where it is not reasonably fit for its intended purpose and where the design has created a risk of harm which is so probable that an ordinary prudent person, acting as the product's manufacturer, would pursue a different available design to substantially lessen the probability of harm.

Torts > Products Liability > Duty to Warn

[HN33] Keyboard manufacturers have no duty to warn, particularly where a plaintiff's use of a keyboard in a repetitive and rapid manner -- thus potentially resulting in symptoms associated with carpal tunnel syndrome -- is characteristic not of the keyboard, but of that plaintiff's work habits. Moreover, in order for a failure to warn claim to succeed, a plaintiff must also offer sufficient evidence indicating that the lack of an adequate warning was a proximate cause of the claimed injuries. If plaintiffs have failed to prove such proximate cause, relying on their warnings expert's vague allegations that repetitive use of the product, or the positioning of the product being used, is the cause of their injuries, plaintiffs' failure to warn claim must be dismissed.

Torts > Products Liability > Duty to Warn

[HN34] A manufacturer's warning to a third person is required when it: (a) knows or has reason to know that the chattel is or is likely to be dangerous for the use for which it is supplied, and (b) has no reason to believe that those for whose use the chattel is supplied will realize its dangerous condition, and (c) fails to exercise reasonable care to inform them of its dangerous condition or of the facts which make it likely to be dangerous.

Torts > Products Liability > Duty to Warn

[HN35] The standard for determining the duty of a manufacturer to warn is that which a reasonable or reasonably prudent person engaged in that activity would

have done, taking into consideration the pertinent circumstances at that time. Delaware courts further hold that a manufacturer is not required to warn a consumer about potential harm which is open and obvious to the user of the product. Under Delaware law, the duty to warn extends only to those who can reasonably be assumed to be ignorant of the danger. Under Delaware law, the existence of a duty to warn is a question of law for the court.

Torts > Products Liability > Duty to Warn

[HN36] There is no duty to warn about the physical manipulation inherent in the use of certain objects which can in some persons and under some circumstances cause carpal tunnel syndrome. Therefore, the threshold issue for consideration in such a case is whether plaintiffs have proffered sufficient evidence to establish that the alleged danger is not simply the repetitive motion required to use defendant's products. If plaintiffs cannot make such a showing, then their failure to warn claim must be dismissed as a matter of law because defendants would have no duty to warn against any such danger.

Torts > Products Liability > Duty to Warn

[HN37] Under Delaware law, a defendant is not required to warn a consumer about potential harm which is open and obvious to the product's user.

Torts > Products Liability > Negligence

Torts > Causation > Proximate Cause

[HN38] In a negligence action or products liability claim, the plaintiff must prove all elements of the claim, including that of proximate causation. The establishment of proximate cause requires that the plaintiff prove that but for the tortious conduct of the defendant, the injury which was suffered would not have occurred.

Torts > Causation > Proximate Cause

Evidence > Witnesses > Expert Testimony

[HN39] While a temporal association is sufficient for accepted scientific methodology, reliability and fit under Fed. R. Evid. 702, it does not necessarily equate to proximate cause. Being a substantial factor may meet scientific methodology considerations but does not meet the "but for" requirement of proximate cause.

Torts > Products Liability > Duty to Warn

[HN40] Industry custom does not establish a legal duty.

Evidence > Hearsay Rule & Exceptions > Hearsay Within Hearsay

[HN41] Upon a document proffer, the proponent must establish that both the document itself and the hearsay statements contained therein fit within an exception to the hearsay rule. Fed. R. Evid. 805.

1997 U.S. Dist. LEXIS 8016, *

COUNSEL: Robert Jacobs, Esquire, Jacobs & Crumplar, Wilmington, Delaware, attorney for plaintiffs.

Allen M. Terrell, Jr., Esquire, Frederick L. Cottrell, III, Esquire and John T. Dorsey, Esquire, Richards, Layton & Finger, Wilmington, Delaware, attorneys for defendant.

JUDGES: Mary Pat Trostle, U.S. Magistrate-Judge

OPINIONBY: Mary Pat Trostle

OPINION:

MAGISTRATE'S REPORT AND RECOMMENDATION

Dated: May 19, 1997

Wilmington, Delaware

Mary Pat Trostle, U.S. Magistrate-Judge

PROCEEDINGS

On June 22, 1992, plaintiffs Patricia Bowers Mathis n1 ("Bowers") and Susan and George Allen n2 ("Allen") filed this product liability action against defendant International Business Machines Corporation ("IBM") in United States District for the Eastern District of New York, alleging that plaintiffs suffered wrist injuries solely as the result of typing on computer keyboards manufactured by defendant. D.I. 1. n3 Specifically, the Complaint included claims of negligence, strict liability, loss of consortium and punitive [*2] damages. D.I. 1. n4 IBM filed its Answer on September 21, 1992. D.I. 3. On April 20, 1994, the action was transferred to the U.S. District Court for the District of Delaware (D.I. 10), with the case filed in this District on May 19, 1994. D.I. 12. Discovery thereafter ensued.

n1 Plaintiff Mathis initially filed under her maiden name of Bowers. For the purposes of this opinion, plaintiff is referred to by her maiden name of Bowers. D.I. 322 at 1.

n2 Plaintiff Susan Allen is joined by her husband, George, in this action. For the purposes of this Report and Recommendation, the Court solely refers to Ms. Allen as the plaintiff, addressing her as "Allen."

n3 Plaintiffs' alleged medical conditions are commonly classified as "repetitive stress injuries" ("RSI"), currently the subject of numerous ac-

tions against computer manufacturers across the nation.

n4 The [HN1] claims for loss of consortium and punitive damages are dependent upon the survival of the negligence claim. See, e.g., *Farrell v. Armstrong Cork Co.*, 457 A.2d 763, 770 (Del.Super. 1983) (consortium claim is derivative); *E.I. duPont de Nemours and Co. v. Admiral Ins. Co.*, C.A. No. 89C-AV-99 slip op. at 21 (Del.Super. July 14, 1994) (punitive damages is derivative).

[*3]

On May 16, 1995, the Court signed a stipulated Order dismissing all claims based on breach of warranty and strict liability. D.I. 209. Thus, the only remaining liability claim is premised on the alleged negligence of defendant.

On October 10, 1995, the Court signed an Order setting forth the procedure for filing motions for summary judgment. D.I. 247. Defendant now moves for summary judgment, arguing that: (1) plaintiffs' proffered expert testimony is inadmissible under *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993), as applied by *Schneck v. IBM*, 1996 U.S. Dist. LEXIS 17486, C.A. No. 92-4370(GEB), (D.N.J. June 25, 1996); (2) plaintiffs have failed to establish negligence on the part of IBM under either of the proposed theories of defective design or failure to warn; and (3) Bowers' claims are untimely. D.I. 309. Plaintiffs counter that: (1) their expert witnesses satisfy Daubert's criteria for admissibility of testimony; (2) IBM was cognizant of the deleterious flaws in the design of its keyboards, yet failed to correct the defects or, in the alternative, provide appropriate warnings to consumers, as did other similarly situated keyboard manufacturers; [*4] and (3) the filing of Bowers' suit was within the applicable statute of limitations, as evidenced by her medical records and controlling case law. D.I. 322. Briefing was completed and oral argument on defendant's motion occurred on September 4, 1996. *In limine* hearings addressing the qualifications and admissibility of plaintiffs' proffered experts and their testimony were conducted on November 20, 23 and 27, and December 4 and 6, 1996.

BACKGROUND FACTS

Plaintiff Allen is a 34-year-old mother of two who now works as a part-time receptionist for The News Journal Company ("News Journal"). Allen has accomplished raising her family, including attending to household chores and pursuing hobbies to varying degrees, while working throughout in a variety of jobs. For instance, while in high school in 1978, Allen was em-

1997 U.S. Dist. LEXIS 8016, *

ployed part-time by Woolco Department Store as a clerk, stocking shelves, tagging merchandise, and ringing up customers' purchases on a manual cash register of unknown manufacture. Thereafter, Allen worked part-time for several months at Mister Donut, filling donuts, lifting trays and operating a cash register of unknown origin. D.I. 311, Ex. A-688-94.

In late [*5] 1980 or early 1981, Allen assumed a position as salad maker for the restaurant Royal Exchange, primarily cutting vegetables. In 1981 or 1982, she was employed full-time n5 as prep cook for H.A. Winstons, preparing soups and sauces, cole slaw and carrot salad. D.I. 311, Ex. A-699-702.

n5 As prep cook for H.A. Winstons, Allen worked seven hours a day, five days a week. D.I. 311, Ex. A-694-96.

Allen's professional relationship with the News Journal began in 1983, when she commenced part-time employment as a clerk in the Circulation Department. In this position, Allen answered phones and hand-wrote complaints about the newspaper's delivery service, averaging between 25 and 50 calls per day. No computer was utilized in this capacity. D.I. 311, Ex. A-702-706. After several months, plaintiff changed jobs within the Department, assuming work as a verifier. As such, she used a pen and paper to complete forms after receiving calls from customers. D.I. 311, Ex. 706-708.

After working approximately six months as a verifier, [*6] Allen commenced the new position of verifier/clerk, initially working five days per week, but sometime thereafter decreasing hours to four days per week. As verifier/clerk, Allen used a computer. D.I. 311, Ex. A-709-11.

In approximately 1991, Allen began experiencing pain, numbness and tingling in her hands which ultimately necessitated bilateral carpal tunnel syndrome ("CTS") releases in March and June of 1992. D.I. 311, Ex. A-713-14, Ex. A-719. After the surgery, plaintiff returned to the News Journal, first as a typist, and then in her current post as receptionist, a part-time position held since approximately November 1992. n6 In her capacity as receptionist, Allen answers telephone calls and hand-writes messages. She recently has resumed typing. D.I. 311, Ex. A-720-21, 774-75. Plaintiff denies additional injury to her wrists other than a winter 1994 sprain to her right wrist due to a fall on the ice. D.I. 311, Ex. A-723-24.

n6 As a receptionist, Allen works four-and-a-half hours per day, five days a week. D.I. 311, Ex. A-721-22.

[*7]

As previously noted, besides her professional employment, Allen has been raising a family, for whom she did most of the cooking. Plaintiff's outside hobbies and interests include gardening and bowling in a league for several years. D.I. 311, Ex. A-715-17.

Plaintiff Bowers is a 50-year-old mother of four currently working as a verifier/clerk for the News Journal. D.I. 311, Ex. A-760-61. Like Allen, Bowers has raised a family while working in a number of different jobs throughout the years, commencing her employment as a part-time housekeeper at nine years of age. At age 12, Bowers began work at a mushroom factory, picking mushrooms. Two years later, she switched to canning the mushrooms. D.I. 311, Ex. A-726-29.

After marriage, Bowers took a hiatus from the workforce to raise her children, returning in 1972 to part-time work as floor person and cashier for J.C. Penneys, with whom she remained until 1980. D.I. 311, Ex. A-730-32. While with that store, plaintiff used a "very old standard type of [cash] register [which] was nothing to my knowledge like IBM or anything. It just had regular keys that you would hit for ringing up a sale." D.I. 311, Ex. A-731.

Bowers next job was as [*8] a part-time customer service representative and cashier for Strawbridge and Clothier, a position held until she rejoined J.C. Penneys in 1989. D.I. 311, Ex. A-733-35. She could not recall the manufacturer of Strawbridge's "electronic-type" cash register. D.I. 311, Ex. A-734.

In 1981, plaintiff Bowers also began weekend work in the Circulation Department at the News Journal, answering telephone calls from customers, and writing down their orders and comments/complaints. Her work hours and responsibilities ultimately increased. In 1985, Bowers started to use a computer of unknown manufacture at her job. D.I. 311, Ex. A-734, Ex. A-740-45.

Plaintiff Bowers first noticed symptoms associated with carpal tunnel syndrome in her hands and wrists in 1989, characterizing the sensations as "aching," "tingling" and "numbness," progressing to "severe pain" which woke her up at night. D.I. 311, Ex. A-756. She consulted an HMO about the complaints on March 10, 1990 and ultimately underwent bilateral CTS surgery. Since that time, she has returned to work as a customer service representative with the News Journal, and continues to use a computer in her job. D.I. 311, Ex. A-758-61.

Although Bowers [*9] attributes her CTS symptoms to her utilization of IBM computer equipment at the newspaper, she also worked an unidentified cash register at Acme Markets for approximately two years (1992 until 1994), until she left the position due to a back injury resulting from a fall at the News Journal. D.I. 311, Ex. A-736-39, Ex. A-772, A-781. Like Allen, she has pursued a variety of hobbies/activities involving extensive hand movement, including gardening, every day meal preparation and bowling. Bowers also is an accomplished seamstress, having learned to sew at approximately age 15, sewing daily both by machine and by hand. D.I. 311, Ex. A-746-54.

Both plaintiffs argue that their CTS impairments are a result of defendant's negligence, where IBM's keyboards used by plaintiffs were of a defective design, and the company further failed to warn of possible injuries as a result of their use. D.I.2. Plaintiffs also contend that there is no "precise moment of injury," but rather that the injuries represent a "cumulative and prolonged process." D.I. 2.

IBM counters that the keyboards at issue did not proximately cause plaintiffs' medical problems, that the company did not have a duty to warn of any [*10] consequences of use of the computer equipment, and that Bowers' claim is precluded by the applicable statute of limitations, where her symptoms were discernable and in fact reported over two years prior to the filing of this action. D.I. 309, 334.

STANDARDS OF REVIEW

Summary Judgment

[HN2] *Federal Rule of Civil Procedure 56(c)* provides that a party is entitled to summary judgment where "the pleadings, depositions, answers to interrogatories and admissions on file, together with the affidavits, if any, show that there is no genuine issue of material fact and that the moving party is entitled to judgment as a matter of law." [HN3] Although the party seeking summary judgment always bears the initial responsibility of informing the Court of the basis for its motion, and identifying those portions of the pleadings, papers and documents on file, including affidavits, which demonstrate the absence of a genuine issue of material fact, where the non-moving party opposing summary judgment has the burden of proof at trial on the issue for which summary judgment is sought, he must then make a showing sufficient to establish the existence of an element essential to his case. *Celotex Corp. v. Catrett*, 477 U.S. 317, 322, 91 L. Ed. 2d 265, 106 S. Ct. 2548 (1986). In other words, that "... there are any genuine factual issues that properly can be resolved only by a finder of fact because they may reasonably be resolved in favor of either

party." *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 250, 91 L. Ed. 2d 202, 106 S. Ct. 2505 (1986) (emphasis added). If the non-moving party fails to make such a showing, then the moving party is entitled to judgment as a matter of law. *Celotex Corp.*, 477 U.S. at 322-23.

[HN4] Factual disputes that are irrelevant or unnecessary will not be counted. *Anderson*, 477 U.S. at 248. The mere existence of a scintilla of evidence in support of the non-moving party will not prevent the grant of a motion for summary judgment; there must be enough evidence to enable a jury to reasonably find for the non-moving party on that issue. *Id.* at 249. Mere speculation or conjecture by the non-moving party clearly cannot preclude the granting of summary judgment. Thus, a court may render summary judgment as a matter of law only in those instances where there are no issues of fact and no conflicting inferences. *Id.*

1. Admissibility of [*12] Expert Testimony

In *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, the Supreme Court delineated the standards and reasoning applied in determining the admissibility of expert scientific testimony. 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993). The Third Circuit has interpreted *Daubert* as characterizing [HN5] the district court's role as that of "gatekeeper," ensuring that the methodology upon which the expert opinion is based is reliable; that is, that the expert's conclusion is premised upon the methods and principles of science. *In re Paoli Railroad Yard PCB Litigation*, 35 F.3d 717, 732 (3rd Cir. 1994) ("Paoli II"), cert. denied sub nom., 115 S. Ct. 1253 (1995).

[HN6] *Rule 702 of the Federal Rules of Evidence*, which governs testimony by experts, requires that: (1) the proffered witness must be an expert (qualified); (2) the expert must testify to scientific, technical or specialized knowledge (reliable); and (3) the expert's testimony must assist the trier of fact (relevance). n7 *United States v. Velasquez*, 33 V.I. 265, 64 F.3d 844, 849 (3rd Cir. 1995) (citing *Paoli II*, 35 F.3d at 741-42). *Federal Rule of Evidence 104(a)* mandates that district courts make preliminary determinations "concerning [*13] the qualification of a person to be a witness, [and] ... the admissibility of evidence." *Id.* (citing *Daubert*, 113 S. Ct. at 2796). Thus, a district court faced with a proffer of expert testimony must make a preliminary determination of all of the aforementioned elements of *Fed.R.Evid.* 702, in an effort to ensure both the reliability and relevance of the expert testimony. *Id.* (citing *Daubert*, 113 S. Ct. at 2795-96; *United States v. Downing*, 753 F.2d 1224, 1237 (3rd Cir. 1995)).

n7 [HN7] *Fed.R.Evid.* 702 specifically provides that:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.

Requisite one of *Fed.R.Evid.* 702, that the proposed witness be an expert, has been construed liberally by the Third Circuit. *Velasquez*, 64 F.3d at 849 (citing [*14] *Paoli II*, 35 F.3d at 741). In fact, this Circuit has "held that a broad range of knowledge, skills, and training qualify an expert as such," and has "eschewed imposing overly rigorous requirements of expertise." *Id.* (quoting *Paoli II*, 35 F.3d at 741). See also *Hammond v. International Harvester Co.*, 691 F.2d 646, 653 (3rd Cir. 1982) (an engineer with sales experience in automotive and agricultural equipment, who also taught high school automobile repair, was permitted to testify in a products liability case involving tractors). However, the level of expertise may affect the reliability of an expert's opinions under the second and third elements of Rule 702.

[HN8] Rule 702's second requirement, that the expert testify to scientific, technical or other specialized knowledge, is designed to ensure the trustworthiness or reliability of the expert's testimony. *Velasquez*, 64 F.3d at 849. Under Daubert, a district court presented with a proffer of expert "scientific" testimony must make a "preliminary assessment of whether the reasoning or methodology of the underlying testimony is scientifically valid" by considering all factors related to the proffered testimony's reliability. [*15] n8 *Id.* (quoting *Daubert*, 113 S. Ct. at 2796-97). Where an expert has "good grounds" for his testimony, thus basing his opinion "on the 'methods and procedures of science' rather than on 'subjected belief or unsupported speculation'," that scientific evidence is deemed sufficiently reliable. *Paoli II*, 35 F.3d at 742 (quoting *Daubert*, 113 S. Ct. at 2795). The Third Circuit has specifically admonished against applying the reliability requirement too strictly, explaining that "the requirement must not be used as a tool by which the court excludes all questionably reliable evidence. The ultimate touchstone [of admissibility] is helpfulness to the trier of fact." *Velasquez*, 64 F.3d at 850 (quoting *Paoli II*, 35 F.3d at 744).

n8 The Paoli II court identified [HN9] several factors to consider in the preliminary determination of the reliability of scientific testimony, including, but not limited to:

- (1) whether the method consists of a testable hypothesis; (2) whether the method has been subject to peer review; (3) the known or potential rate of error; (4) the existence and maintenance of standards controlling the technique's operation; (5) whether the method is generally accepted; (6) the relationship of the technique to methods which have been established to be reliable; (7) the qualifications of the expert witness testifying based on the methodology; and (8) the non-judicial uses to which the method has been put.

Velasquez, 64 F.3d at 849 n.8 (quoting *Paoli II*, 35 F.3d at 742 n.8). As noted by the Third Circuit, Daubert includes two factors not previously applied by the court in *Downing* (cited in the body of this Report and Recommendation at 12), those being whether a method produces a testable hypothesis and the existence of standards controlling the technique's operation. However, Daubert fails to include in its list a number of factors applied in *Downing* -- the extent of the expert's qualifications, the relationship of a technique to "more established modes of scientific analysis," and the "non-judicial uses to which the scientific techniques are put." *Downing*, 753 F.2d at 1238-39; *Daubert*, 113 S. Ct. at 2796-97. Since Daubert did not specifically disavow any factors contained in *Downing*, a district court is directed to consider all factors included in Daubert and *Downing* "as well as any others that are relevant." *Paoli II*, 35 F.3d at 742.

[*16]

[HN10] The final requirement of *Fed.R.Evid.* 702 addresses the relevancy of the evidence, ensuring that the evidence "fits" under the facts of the case -- i.e., that there is a valid connection between the "scientific research or test result to be presented (expertise) and the particular disputed factual issues in the case." *United States v. Downing*, 753 F.2d at 1237. See also *Velasquez*, 64 F.3d at 850; *Paoli II*, 35 F.3d at 742-43. Therefore, to

satisfy the helpfulness standard under Rule 702, a valid scientific bridge must exist under this pertinent inquiry as a precondition for the evidence to be admissible. The fit standard requires more than bare relevance -- a *prima facie* showing that the technique is reliable is insufficient. *Paoli II* 35 F.3d at 743. To meet this requirement, the party introducing the proffered testimony must demonstrate by a preponderance of the evidence that its experts' opinions are reliable. In other words, that they are based on "good grounds." *Id.* at 743-44. Therefore, the Daubert analysis focuses "solely on the principles and methodology, and not on the conclusions" generated. *Id.* at 744; quoting *Daubert*, 113 S. Ct. at 2797. [*17]

[HN11] Although such evidence meets the parameters of *Fed.R.Evid.* 702, it still must satisfy *Fed.R.Evid.* 403, which mandates that a district court consider whether the admission of proffered testimony might confuse or overwhelm the jury. n9 As a result, the balancing test of probative versus judicial value of evidence under Rule 403 is particularly significant when evaluating expert testimony. *Paoli II*, 35 F.3d at 747. As the Third Circuit commented in *Paoli II*:

[A] district court cannot exclude a scientific technique as too confusing and overwhelming simply based on its conclusion that scientific techniques by their very nature confuse and overwhelm the jury. There must be something about the particular scientific technique such as its posture of mythic infallibility that makes it especially overwhelming.

35 F.3d at 746. n10

Consequently, "in order for a district court to exclude scientific evidence, there must be something particularly confusing about the scientific evidence at issue . . ." *Id.*

n9 As noted by the Third Circuit in *Downing*, the analysis under Rule 702 overlaps with the considerations under Rule 403, but allows "some room for Rule 403 to operate independently." *Paoli II* 35 F.3d at 746. As will be addressed later in this Report and Recommendation, the application of Rule 403 in a pre-trial setting is somewhat limited.

[*18]

n10 However, as noted in *Paoli II*, the Daubert holding that Rule 702 operates as the primary focus of a court's gatekeeping function indicates that exclusion of an expert's testimony under Rule 403 would be rare in spite of the Third Circuit's finding that Rule 403 provides judges with greater power over experts than ordinary witnesses. Both rules provide slightly more judicial substantive power than usually exists under Rule 403 to determine that the evidence is more prejudicial than probative. *Paoli II*, 35 F.3d at 747 n.16.

Regarding the application of Rule 703 to the analysis required of expert testimony, in *Paoli II*, as a result of Daubert, the Third Circuit modified its previous holding in *DeLuca v. Merrell Dow Pharmaceuticals, Inc.*, 911 F.2d 941 (3rd Cir. 1990) (although a district judge makes a factual finding as to what data experts find reliable, if an expert avers that his testimony consists of data upon which other experts in the field find reasonable, such averment was generally sufficient to survive a Rule 703 inquiry). *Paoli II*, 35 F.3d at 747. [HN12] Although [*19] a court's gatekeeping role is the primary focus of Rule 702, this purpose permeates the other Rules of Evidence. Therefore, when a trial judge is required to analyze whether an expert's data is the kind upon which other experts would reasonably rely, to satisfy Rule 703 the court now must

assess whether there are good grounds to rely on this data to draw the conclusion reached by the [testifying] expert. Whether experts in the field rely on this type of data will simply continue to be part of the judge's analysis.

Paoli II, 35 F.3d at 748-49.

Therefore, the dichotomy of admissibility between Rules 702 and 703 has been eliminated.

2. Delaware Statute of Limitations pertaining to Personal Injury Actions

[HN13] According to 10 Del. C. § 8119, the statute addressing time limitations for the filing of personal injury claims,

No action for the recovery of damages upon a claim for alleged personal injuries shall be brought after the expiration of 2 years from the date upon which it is claimed that such alleged injuries were

1997 U.S. Dist. LEXIS 8016, *

sustained; subject, however, to the provisions of § 8127 of this title.

DISCUSSION

I. Is plaintiff Bowers' personal injury [*20] claim timely under the applicable statute of limitations?

As noted, in Delaware the statute of limitations applicable to personal injury claims provides that all such actions for recovery must be brought within 2 years from the date upon which it is claimed that the alleged injuries were sustained. 10 Del. C. § 8119. In light of this time limitation, defendant argues that Bowers' claim is barred where the evidence indicates that she experienced symptoms in her hands and wrists as early as March 10, 1990, but did not file her complaint against IBM until June 22, 1992. D.I. 309. Plaintiffs maintain that Bowers' current action falls within the confines of 10 Del. C. § 8119, as interpreted by the Delaware Supreme Court in *Collins v. Pittsburgh Corning Corporation*, because the statutory period began to run when Bowers was chargeable with the knowledge that her condition was attributable to the repetitive use of the IBM computer. 673 A.2d 159 (Del. 1996). According to Bowers, she became cognizant of that fact only after a July 26, 1990 consultation with her neurosurgeon, Dr. Magdy Boulos ("Boulos"), and therefore, the statutory period began to toll as of the date of that [*21] examination. D.I. 322 at 50.

Plaintiff Bowers incorrectly applies the provisions of 10 Del. C. § 8119, misinterpreting the relevant case law. In *Layton v. Allen*, the Delaware Supreme Court found the plaintiff's 1966 medical malpractice claim timely, where in 1965, the plaintiff first experienced pain caused by a hemostat allegedly negligently left in her abdomen during a 1958 surgery. 246 A.2d 794, 798 (Del. 1968). The court held that:

...when an inherently unknowable injury, such as is here involved, has been suffered by one blamelessly ignorant of the act or omission and injury complained of, and the harmful effect thereof develops gradually over a period of time, the injury is 'sustained' under [section] 8118 when the harmful effect first manifests itself and becomes physically ascertainable. Translated in the terms of this case, we hold that the limitations period commenced to run when the plaintiff first experienced pain caused by the unknown foreign object.

Id. (emphasis added).

Thus, in *Layton*, the plaintiff's claim was not time barred where she first experienced the pain associated with defendant's negligence and filed [*22] her claim within two years thereafter. Delaware courts expounding upon the principle espoused by *Layton* consistently have held that [HN14] a plaintiff's first manifestation of pain - rather than the date of a definitive diagnosis - triggers the statute of limitations clock. See *Greco v. University of Delaware*, 619 A.2d 900, 905 (Del. Supr. 1993); *Cole v. Delaware League for Planned Parenthood, Inc.*, 530 A.2d 1119, 1124 (Del. 1987) ("For the statute of limitations to begin to run, plaintiff is not required to have knowledge of a causal relationship between the initial injury and the defendants' tortious conduct"). Indeed, the court in *Collins v. Wilmington Medical Center* specifically rejected the theory that the Section 8119 statute of limitations would not commence until a diagnosis was made:

[HN15]

Commencement of the running of the statute does not depend on when a diagnosis is made or a "cure" effected. If it did, the statute would never start in some cases. The statute starts, rather, when a harmful effect first manifests itself and becomes physically ascertainable. In short, manifestation of the problem, not its cure, is the test under *Layton*.

319 A.2d 107, 108 [*23] (Del. Supr. 1974). n11

n11 Plaintiffs' citations to personal injury "asbestos cases," where Delaware courts have held that the Section 8119 statute of limitations is triggered when the plaintiff is chargeable with the knowledge that his condition is attributable to asbestos exposure are inapplicable to the case at bar. See e.g., *Collins v. Pittsburgh Corning Corporation*, 673 A.2d 159, 162 (Del. 1996). Asbestos-related medical conditions, of which there are a variety, can manifest symptoms, such as shortness of breath or coughing, well in advance of the detection of asbestos in the lungs. Asbestosis is thus a "latent" disease which cannot be traced to an asbestos manufacturer until the asbestos is discovered in the lungs. Further, under Delaware law the courts have recognized that a different beginning of the limitation period may be applicable for different conditions (e.g., pleural thick-

1997 U.S. Dist. LEXIS 8016, *

ening, asbestosis, lung cancer) having different manifestation dates. As a result, Section 8119 may operate to bar a claim for one type of asbestos-related condition, such as pleural thickening, but not for another, that is, asbestosis. *Sheppard v. AC&S Company*, 498 A.2d 1126 (Del.Super. 1985), *aff'd sub nom., Keene v. Sheppard*, 503 A.2d 192 (Del. 1986).

[*24]

Plaintiff Bowers clearly experienced the symptoms now at issue more than two years prior to the June 22, 1995 filing date of the complaint, as evidenced by the following colloquy between Bowers and defendant's counsel at her deposition:

Q: When was the first time that you were aware of any type of symptoms in your wrists or hands?

A: What year are you saying?

Q: Yes.

A: Probably around '89. You know how well -- with myself, when I'm in pain I'll endure it for a while before I think it's something serious.

D.I. 310, Ex. A-755.

This testimony is confirmed by Bleeker in her November 11, 1994 occupational neurology evaluation, wherein the doctor recorded that Bowers "began experiencing symptoms in her hands in 1989," (D.I. 310, Ex. A-113), and is also confirmed by Bowers' neurosurgeon, Magdy Boulos, in a follow-up letter after her July 26, 1990 examination. n12 Indeed, the June 20, 1990 physician progress notes from Bowers' HMO indicate that plaintiff had been experiencing "arm numbness" including "1 month [history] of intermittent lower left arm and hand paresthesias when waking from sleep or after brushing hair," with similar symptoms in the right [*25] arm. D.I. 310, Ex. A-799. Moreover, in March 10, 1990 HMO progress notes, Bowers' physician raised the possibility of "De-Quervein" or "Tenosynovitis." D.I. 310, Ex. A-780.

n12 In his July 31, 1990 letter to Dr. Theodore Michel, Bowers' HMO physician, Boulos recounted Bowers' July 26, 1990 reported medical history of the pain in question: "About two months ago [Bowers] started experiencing numb-

ness, paresthesias and pain in both her hands. ..." D.I. 310, Ex. A-777.

The fact that Bowers may have been diagnosed *definitively* within the two-year period prior to her filing this action is *not* the controlling factor according to relevant case law, despite plaintiff's protests to the contrary. What is of consequence is the unrefuted testimony by plaintiff herself, corroborated by the medical evidence, that plaintiff suffered discernable symptoms of her medical condition at issue *prior* to two years before this suit was filed. As such, under 10 Del. C. § 8119, plaintiff Bowers' claim is time-barred and [*26] this Court recommends that her action be dismissed.

II. Do plaintiffs' proposed witnesses satisfy the Daubert test?

Plaintiffs submit four liability expert witnesses to establish that (1) the existence of design defects in IBM's keyboards at issue (2) caused plaintiffs' repetitive stress injuries, which (3) could have been prevented had proper warnings as to the use of the *inherently dangerous* instrumentalities been provided, as IBM was obliged to so do. To this end, Drs. Karl Kroemer ("Kroemer") n13 and Robert Cunitz ("Cunitz") would proffer on, respectively, the state-of-the-art and design defects in the keyboards and the appropriate warnings and instructions negligently omitted by IBM, while Drs. Margit Bleeker and Laura Punnett addressed the element of causation. As provided by the Court, with concurrence of the parties, Drs. Kroemer and Punnett's depositions taken during the similar Schneck action now serve as their proffered expert testimony, supplemented as necessary to address the specifics of this action. Schneck, C.A. No. 92-4370(GEB), (D.N.J. June 25, 1996). n14

n13 Dr. Kroemer, a generic and not plaintiff-specific expert, was originally assumed by defendant as being offered as a "state-of-the-art" expert, who would not be addressing design defects, and would limit his opinions to those allowed and testified to in Schneck. During his *in limine* hearing, two additional reports by him were identified by plaintiffs' counsel as part of his opinion -- the reports of August 17, 1995 and September 15, 1995 -- both of which dealt with his analysis of alleged defects in the design of generic keyboards. D.I. 303 at 28-57. A substantial amount of the Kroemer *in limine* transcript is devoted to plaintiff's counsel's failure to adequately identify the areas (state-of-the-art and design defects) on which Kroemer would testify, and counsel's similar failure to identify these two reports. D.I. 359 at 28-57, 118-144, 177-182. During this colloquy,

it was learned that plaintiffs' counsel had provided a copy of reports to the Court, after the September 16, 1996 hearing on whether the *in limine* hearings were required, but provided the defense with only a copy of the August 17, 1995 report. D.I. 359 at 178. Of note, neither report was specifically referenced in plaintiffs' brief.

The previous information provided regarding Kroemer's proffer included a March 30, 1992 report expressing his opinion on the state-of-the-art or cumulative trauma disorders, attached to which was a CTD bibliography review, an updated bibliography review on keyboarding dated February 5, 1994 (D.I. 310, Ex. A-313-462), and another bibliography update of February 28, 1995 on articles relating to keyboards. D.I. 329, Ex. 53. Neither the March 30, 1992 report nor literature abstracts contained any opinion by Kroemer on alleged defective design of any keyboards, including the abstract of his own 1964 and 1972 articles. None of this material contained or referenced any opinion expressed by Kroemer as to defective design nor the measures/methods available for improvement. As a result, neither his methodology nor the scientific reliability regarding these issues were provided.

However, the August 1995 report titled *Ergonomic Deficiencies of Conventional Keyboards* appears to express his opinions on keyboard designs. D.I. 352, Ex. 77. Similarly, his subsequent report of September 15, 1995 (*Design Deficiencies of Conventional Keyboards*) contained Kroemer's opinions on design defects. Since Kroemer had previously been identified or described as an ergonomist and human factors engineer, concerned with biomechanical and applied physical aspects involved in workplace design, planning, set-up and psychology, and since his August 1995 report had been provided, he was allowed to testify as to his opinion on design defects limited to his August 1995. Kroemer's September 1995 report was not admitted and no examination on that report was permitted.

[*27]

n14 The Schneck decision is now on appeal to the Third Circuit.

The Schneck case stands as precedent on the issues correctly raised. n15 In Schneck, the plaintiff allegedly developed bilateral carpal tunnel syndrome after working on IBM punch and data entry machines. Her action

against IBM was premised upon the theories of strict liability, negligence and breach of warranty, with testimony from expert liability witnesses offered. As here, IBM moved for summary judgment, arguing in part that plaintiff's experts were inadmissible under Daubert. Focusing on *Fed.R.Evid. 702*'s expert witness testimony requirements, the Schneck court analyzed whether the proffered experts could provide "scientific, technical, or other specialized knowledge" to "ensure the reliability or trustworthiness of the expert's testimony," finding that plaintiff's retained experts on the issues of design defect and failure to warn (Drs. Karl Kroemer and Samuel Glucksberg, respectively) did not satisfy Daubert's scrutiny. Schneck at 15, 25 (citation omitted). Specifically, the Schneck court concluded, [*28] upon conducting an *in limine* hearing, that "there is no 'connection between the scientific research and test result to be presented, and particular disputed factual issues in the case.'" Id. at 25 (citation omitted).

n15 The Court will, however, address plaintiffs' references to court decisions on this issue in other jurisdictions which allowed plaintiffs' experts' testimony-- to this limited degree. Plaintiffs' references to *Smith v. IBM* and *Davis v. NCR* essentially are inapplicable to the matter at hand. *Smith*, Civ. No. 94-34-P-C, U.S.D.C. (D.Me. Jan. 19, 1996); *Davis*, No. 9496092/CL183437 slip op. (Cir.Ct.Balt.City May 3, 1996). Neither case presents a detailed Daubert analysis as does Schneck, and both fail to address Frye. Moreover, the *Smith* court entertained several arguments rejected by the court in Schneck, such as defective design and duty to warn. In addition, contrary to plaintiffs' argument, the *Davis* court rejected plaintiffs' claim of punitive damages against IBM. Finally, plaintiffs' reliance on *Davis v. Datapoint* also is misplaced in light of that court's exclusion of Kroemer's testimony and finding that no design defect existed in the computer keyboards in question. *Davis*, 1995 U.S. Dist. LEXIS 21739, Civ. No. 94-56-P-DMC (D.Me. Oct. 31, 1995).

[*29]

While this Court was inclined to find similarly in the case at bar, based upon submitted materials, plaintiffs maintained that an *in limine* hearing is essential prior to the rendering of a decision regarding the qualifications and admissibility of the testimony of plaintiffs' expert witnesses. And, indeed, upon careful review of the parties' arguments and relevant case law on the matter, the Court determined that while the circumstances of this action do not necessarily mandate an *in limine* hearing

for the Court's exclusion of the expert testimony under Rules 702 and 703, Third Circuit case law and the principle that "discretion is the better part of valor" suggested that such a hearing at this stage of the proceeding was an appropriate action.

In the interest of avoidance of a lengthy discourse on the issue, this Court cites the Third Circuit's controlling analysis of the evidentiary matter in *Paoli II*. In that case, the Third Circuit did not clearly address the need for an *in limine* hearing when testimony exclusion is based upon Rule 702. However, it did state unequivocally that [HN16] Rule 403 is rarely appropriate for pre-trial exclusion, because a judge cannot ascertain [*30] potential relevance until that judge has a virtual surrogate for a trial record. *Paoli II*, 35 F.3d at 747; *Paoli I*, 916 F.2d at 859-60. In fact, the appellate court noted in its discussion of Rule 403 that "it is important to determine whether the *in limine* hearing in the district court created the 'virtual surrogate for a trial record' that we have required before exclusion is permissible." *Paoli II*, 35 F.3d at 746-47. Recognizing that the Supreme Court's analysis in *Daubert* in essence "blended" the balancing tests (confusing/overwhelming prong) of Rules 403 and 702, the *Paoli II* court held that [HN17] for exclusion of scientific evidence under Rule 403, "there must be something particularly confusing about the scientific evidence at issue," with "that something" being more than the complexity of such scientific evidence in general. *Id.* at 747. Consequently, to the extent that the balancing "helpfulness" test of Rules 702 and 403 overlap, when that test is employed under Rule 702, as with under Rule 403, it would appear that an *in limine* hearing is required. And thus, while there is no doubt that this Court has been inundated with depositions, affidavits [*31] and expert reports relating to the proffered experts' qualifications and the admissibility of their testimony, and upon which a reasoned decision may have been discharged, it nonetheless chose to err on the side of caution by conducting *in limine* hearings on these issues on November 20, 23 and 27, and December 4 and 6, 1996.

In light of this background and with consideration of all submitted materials and *in limine* testimony, this Court now individually addresses the merits of defendant's motion to exclude plaintiffs' proffered experts.

A. Dr. Karl Kroemer.

An industrial engineer, Dr. Karl Kroemer ("Kroemer") is proffered by plaintiffs as an expert on the relationship between the design and use of keyboards and "cumulative trauma disorders" -- defined by Kroemer as "those disorders stemming from often repeated actions whose cumulative effects finally result in an injury as well as the state-of-the-art in that regard." D.I. 310, Ex. A-313-15. Upon purported review of the relevant litera-

ture on the subject, Kroemer concludes that "the relation between [cumulative trauma disorders] and design and use of keyboard devices was well established." D.I. 310, Ex. A-352. However, [*32] during deposition testimony in the Schneck case as well as the December 4, 1996 *in limine* hearing, Kroemer acknowledged that even today, there is limited knowledge of this hypothesized relationship. D.I. 310, Ex. A-290-91; D.I. 359, Kroemer *In Limine* Hearing, Dec. 4, 1996. In fact, Kroemer wrote a January 5, 1993 letter, referred to in the deposition transcript, which states in relevant part: "there are many different possible causes for [cumulative trauma disorders], some of them related to off-duty activities, some possibly related to activities on-the-job. Of those on-the-job, keyboarding is probably the most prevalent. However, which keyboarding factors contribute under what condition is still largely unknown . . ." D.I. 310, Ex. A-463.

Moreover, as noted in *Schneck*, while Kroemer's conclusion includes a reference to QWERTY keyboard design, such as that of the keyboards at issue, his criticisms are generic; i.e., the binary key use, the arrangement (geometry) and placement of keys (including improper spacing of the keys, necessitating large force and displacement to operate), and the use of the keyboard (keyboard displacement). In support of his conclusion [*33] beyond his years of personal experience, Kroemer has cited a number of scientific, peer-reviewed articles discussing keyboard problems and proposing alternative keyboard designs which comply better with the natural location and motion of fingers, such as the split keyboard. n16 D.I. 352, Ex. 78. However, Kroemer failed to cite any studies which indicate that alternative keyboard designs to the QWERTY keyboard now commonly used actually serve to reduce the incidence of relevant musculoskeletal disorders. D.I. 352, Ex. 78.

n16 However, Kroemer's abstracts of his literature search clearly includes articles that have not been subject to any peer review process. D.I. 359 at 60.

During his deposition and *in limine* testimony for the *Schneck* case, Kroemer was examined about the methodology employed in reaching his conclusions. n17 Concerning his methodology for selecting the literature upon which he based his conclusion, Kroemer provided the following description:

Q: I guess what I want to know from you [*34] is, how did you decide what to include and what not to include in Exhibits

1997 U.S. Dist. LEXIS 8016, *

5 [Kroemer Report] and 6 [Kroemer Supp. Report]?

A: The general issue is the design and use of keyboard and related entry devices. So such papers would be included that directly or indirectly related to this topic. Secondly, I tried to apply some judgment as to the validity of any given publication and such that it would either be contributing towards an assessment of what was known at the time or it would set certain highlights.

Q: So, as I understand it correctly, you look not only at the topic of what a paper was about, but also you read it and analyze its validity before including it in [Exhibits] 5 or 6?

A: Yes.

Q: And therefore you made some judgments as to the validity or lack of validity of what the author or authors were saying in a particular article that was on a topic that dealt with design and use of keyboard and related entry devices?

A: Yes, sir.

Q: And I also take it then that if the author's statements were valid they would be included in these summaries here, Exhibit [sic] 5 and 6, correct?

MR. PHILLIPS: Objection.

A: Valid only [*35] in the sense that they would shed a given light on a topic and perhaps regarding conclusions. But the term "valid," as I understand it, doesn't necessarily mean that I feel that the author would be correct.

D.I. 310, Ex. A-199.

Upon plaintiffs' counsel's objection, Kroemer then retracted his testimony and conceded that a paper or article was considered in his reports solely if it was "relevant." D.I. 310, Ex. A-200. n18 Kroemer maintained that a pub-

lication was included in his report regardless of his views on whether the publication was correct from a scientific, engineering, or medical point of view, however, he excluded articles that were "purely journalistic." D.I. 310, Ex. A-200, A-242.

n17 In Schneck, Kroemer's conclusion included a reference to keyboard design. However, he failed to specify any design defect in the IBM machines which would support plaintiffs' claim that they caused injury. See Schneck Op. at 24-25. Thus, with particular regard to plaintiffs' failure to warn claim, Kroemer's testimony in the Schneck case was limited to the proposition that it was "well-established" that typing itself causes "cumulative trauma disorders." D.I. 310, Ex. A-352.

[*36]

n18 IBM argues that Kroemer's testimony that scientific validity means simply "shedding light on a notion," highlights the unreliability of his testimony and the methodology used in preparing his reports. D.I. 310, Ex. A-200, D.I. 309 at 12. See also, D.I. 359 at 9,77.

During the subsequent course of his *in limine* testimony in Schneck directed to his state-of-the-art opinion, Kroemer was queried about the interim steps between the collection of data and his final analysis:

Q: And can you tell me, how did you get from the collection of articles, where some are in favor of that opinion, and some are against that opinion, and some are in between, how did you get from there, that body of literature, to that conclusion, what criteria did you use?

A: The criteria --

MR. MAIMON: Object to the form. Compound.

THE COURT: Sustained.

BY MR. D'AVANZO (CONTINUED):

Q: How did you --

1997 U.S. Dist. LEXIS 8016, *

MR. MAIMON: I have no objection to how do you -- how did you get there, I --

MR. D'AVANZO: I'm going to amend the question.

THE COURT: Okay.

Q: How did [*37] you get from this body of literature, that was either supportive, or critical or non committal, or in between, with respect to your conclusion, that the relationship was well established?

A: I wish you had left out -- left out the last few words, of your question.

Q: Let me try it again. Let me withdraw. How did you get from this body of literature, to your conclusion?

A: Okay. Now, keep in mind that I worked for -- the first years of my professional life, in a -- in a research institute that had engineers, psychologists, and physiologist, mostly, Mds.

It was quite well established then, that typing was often associated with what we call now, CTDs.

So there was no question even, in the 50's, about it. Or in the 60's. The -- question is, what are the specific relations, and this is of course, a biomechanical problem, as far as I can judge. I cannot medical -- judge it on a medical side, for example.

But whether you do unaccustomed farm work, or whether you do meat cutting, or whether you do keyboarding, it all involves in essence the same so to speak mechanical or biomechanical structures of the body.

So, as -- as you put all that evidence together, it -- it makes [*38] clear and imminent sense to say that the posture, the motion, the forces, the repetitions, the way -- the frequency of -- of doing it, is clearly related to an over exertion of -- of parts of the human body.

Q: And can you tell me what -- withdrawn. Is there a particular methodology that you utilized to go from the knowledge expressed in these articles, to your conclusion?

A: *The methodology would be -- is it plausible according to what we know, about how the body reacts to repetitive exertions of that kind.*

Q: *And now, that -- that criteria, or methodology that you followed, is that something that's normally followed by engineers and ergonomists? In making drawing conclusions from literature?*

A: *Well, I don't know about others, but I would think that is a -- a logical and -- and -- and reasonable way of going about drawing conclusions.*

Schneck Op. at 18-20 (citing Kroemer Tr. at 43-46 (emphasis added)).

During his more recent *in limine* testimony (on both direct and cross-examination), Kroemer similarly articulated the general methodology that he would apply to a state-of-the-art search on a particular ergonomic topic and the subsequent [*39] analysis of the material selected, as well as the specific approach employed to reach his conclusions for these personal injury cases against IBM:

Q: . . . Let's focus in a decade of the 1980's. If one in ergonomics wished, then, to do a search of the available state-of-the-art knowledge of -- in an area, how would one go about it?

A: One would try to collect all information that is relevant to the topic in question and sift through the information available with respect to what appears to be valid and important.

Q: Okay. How would one go about trying to locate the whole arena of knowledge? You know, what type of search would one do, say in the decade of the eighties?

A: If the topic is one in which one has worked before, one probably has a stock of -- of information available already. If the topic would be completely new, one would probably start out with a computerized search of the literature and from there go into specific journals and articles as they become mentioned in the literature.

* * *

THE WITNESS:

1997 U.S. Dist. LEXIS 8016, *

If the question were simply scientific and specific, one might want to limit one's self to the scientific literature. If it is a matter of the [*40] general state of knowledge, then one would go beyond the scientific literature and include items that shed light on the topic in question.

Q: Okay. I think you said, then, that one would sift through and review. Can you explain to the Court what you mean by that?

A: I would go ahead to -- in this procedure, as I find a published article, I would look at the author, at the source of printing the journal or whatever it might be. And from there, proceed to determining what the specific procedures were applied by the author, what the experimental results are, how they are described, and how they are interpreted.

* * *

A: I would include any article that provides reliable or believable or valid information.

* * *

A: If I want to determine the state-of-the-art about a topic, I would include everything, given those criteria fulfilled, regardless of what the outcome or opinion of the author is.

* * *

THE COURT:

How do you determine, Doctor, and what methods or what standards do you use to determine whether an article is valid or important of the topic that you are working on?

THE WITNESS:

After having determined that this is -- a credible author, [*41] institution and journal published, I would go into the question, what are the experimental hypotheses, how were they tested, if subjects involved, how many, how selected. What are -- how -- what data are reported, how were they treated statistically, and, finally, what conclusions were drawn from -- from the data in their statistical evaluation.

THE COURT:

And when you go through that analysis, those standards that you use, those questions that you ask yourself, what is important for you, in your methodology, fact -- what factors are important in those questions in your methodology to analyze whether an article is valid and important for your purposes?

THE WITNESS:

Beyond the -- the items that I already indicated --

THE COURT

I'm trying to find out those standards or those factors within those items that you would be -- for example, one of the things you said was the number of subjects that were studied. I don't know whether there's a breaking point for too little or not enough to be considered a study that you could say, yes, this would

1997 U.S. Dist. LEXIS 8016, *

be a valid hypothesis or a valid conclusion.

THE WITNESS:

That would depend on the specific experiments [*42] conducted. If you want to do a general population statement, then you probably need a large number of subjects. If you wanted to look at within subject, then you might, for instance, need a small number of subjects.

So the number of subjects as an example would depend on the specific hypotheses to be tested.

* * *

Q: . . . In your mind, what is a review article, when we are talking about this area of knowledge in ergonomics?

A: A review article would be one in which several or possibly many studies or other pieces of information are compiled, reviewed, possibly abstracted, and a -- in most cases, a general conclusion is given about what the overall information is on the topic that is being reviewed.

Q: Okay. And how do you apply your criteria to those types of articles?

A: Well, of course, the criteria are somewhat different now, because we don't have a report on an experimental study.

In this case, one would probably look for inclusive necessary, completeness, non-biased reporting, proper abstracting of the original articles. In other words, credibility and validity would be the main criteria.

Q: Okay.

THE COURT:

Okay, Doctor. Before [*43] you go on about that, in the review article scenario that you just discussed, how do you determine credibility of that review article, since part of your analysis includes proper abstracting of original articles.

THE WITNESS:

One is probably not completely naive on the topic. Even if one were, one would have to go back, in many cases, look at some of the originals that are being abstracted and reviewed, determine from there whether the reviewer has done a fair job.

However, this is quite often helped by the fact that the -- the authors are -- there are probably not too many authors in the field. So one has already a feeling for the reputation of the author, the reputation of the institution that the author is associated with. And if it is a published work, what publisher, what journal, does this?

There are a number of journals that specialize, for instance, in annual reviews of certain topics. In such a case, one can be almost assured that this is a solid piece of work.

D.I. 359 at 8-17.

* * *

Q: And can you give me your understanding of what peer review is?

1997 U.S. Dist. LEXIS 8016, *

A: Peer review usually occurs if you submit an article or other piece of work [*44] for publication in a journal, in which case the draft manuscript is reviewed by other persons in the field; that is the peers. And their recommendation is then usually used by the publisher to either accept, reject or recommend revision before publication.

* * *

THE COURT:

Did you feel when you were doing that review [on the state-of-the-art knowledge of issues related to keyboard design, use and possible consequences of injury], that you were limited to cumulative stress trauma-type injuries?

THE WITNESS:

No, I did not feel that I was limited. The judgment was to -- was left to me.

* * *

THE WITNESS:

I would include [in his reports of his conclusions] all information that would pass the criteria that we discussed earlier this morning. I would exclude pieces that would not survive that selection criteria.

THE COURT:

So that whether or not cumulative stress trauma was mentioned in any report, that wasn't one of the bases you used to include or exclude?

THE WITNESS:

The pure mentioning would not be sufficient. It would have to be substantiated.

* * *

Q: And so throughout this review of articles, there are articles, [*45] are there not, that do not deal with keyboards, that is, typewriter or computer keyboards per se; correct?

A: Yes. In some cases, this is the -- it is true. However, the reason why they are in there, because they refer to biomechanical, or the ergonomic aspects that are directly involved in the problems associated with the operation of keyboards.

D.I. 359 at 79.

* * *

A: I would include occasionally trade journal publications like the one we are looking at, which is Rosch, R-o-s-c-h, 1984, on Page A-000422. If they would indicate -- or if they would highlight the state-of-the-art, the state of knowledge, the state of technology available. . .

* * *

THE COURT:

. . . Doctor, when, you review or look over scientific journals, is it your expectation that the information contained in the scientific journals have already been reviewed for accuracy?

THE WITNESS:

If it is a well-known, established journal, such as Human Factors or Ergonomics or some others, of which I know there is a critical review process going on, then my presump-

1997 U.S. Dist. LEXIS 8016, *

tion would be of correctness. I don't recall ever having found it was incorrect. It could be the case. I would presume [*46] it is correct.

THE COURT:

Do you operate on the same presumption when reviewing trade journals?

THE WITNESS:

No, I'm not.

* * *

Q: Dr. Kroemer, I just have one question, perhaps. And that is the methodology and criteria that you utilized in doing your report and your literature review, is that a methodology or criteria that is normally followed by industrial engineers and ergonomists?

A: Which reports are you referring to?

Q: The March 1992 report and the February 1994 review of publications.

A: Of course, I can't speak for everybody else, but I would think that is a normal procedure.

Q: Isn't it true that when I asked you that question in front of Judge Brown at the Schneck hearing in August of 1995, that you told me that you didn't know about whether others utilized that criteria, but that you thought that it was a reasonable way to go about drawing conclusions?

A: You apparently have notes in front of you that I don't have. But I thought I just gave you, in essence, the same answer, even before you read from your notes.

Q: So you don't know if anyone else follows the criteria that you utilized in this case; correct?

A: [*47] That's not what I said. I said I can't speak for others; but I assume this is a method that would be used by others as well.

D.I. 359 at 116-117.

With specific regard to the conclusions purported by Kroemer on design defect, the doctor described his methodology to the keyboard design critique as follows:

Q: . . . Now, if a person who has your experience in keyboards and key -- keyboard design is presented with a keyboard to critique with respect to any design deficiencies, how do you approach critique [on] that? On what do you rely?

A: Well, you might say certain levels of evaluation. The first one is simply a visual inspection, in terms of size, number of keys, arrangement of keys, maybe angles, slopes, whether or not there is a split and so forth.

And a second level of evaluation, then, would be followed by distinct measurements, such as of key force displacement characteristics and other issues that would not be obvious to the naked eye.

* * *

D.I. 359 at 158-59.

A: . . . Having been in the field so long, it's rather difficult to try to separate out a continuous assessment procedure. But, first of all, I've seen many keyboards and I've [*48] used many keyboards, so I have, I think, a lot of experience.

The experience then relates to the issues that I have indicated before, which is zig-zag columns or -- sorry -- straight columns, straight rows, horizontal rows, large number of keys, keys in one row in a horizontal plan, so forth. So these are the same issues that I have mentioned before.

Secondly, one would probably go ahead and, as appropriate, try to compare the keyboard in question with certain literature, if this is an issue. It might be a special use keyboard as opposed to a general use keyboard.

Q: We're assuming this is a very general-use PC keyboard.

A: Then I don't think I have to go to much literature, although I could go ahead and compare it with and see 100 of 1988 or something of that kind. So I would find, if needed, some reference publications to compare it to.

And then the third step, as I've said, is to take specific measurements that cannot be done by simply looking and visually examining the keyboard.

Q: Okay. And with respect to keyboard geometry, would you use the same procedure?

A: Yes, that would be very much the same procedure.

D.I. 359 at 164-65.

When [*49] Kroemer was queried by the Court about the type of measurement analysis conducted with regard to his criticisms of keyboard placement and keyboard use in the typical QWERTY keyboard, the following colloquy resulted:

THE COURT:

All right. Could you please turn to item No. 4? Keyboard placement, Concern No. 4. Why are measurements taken under that circumstance?

THE WITNESS:

The keyboard placement should be done in such a way that is comfortable

and healthy for the operator to operate the keyboard.

A general rule would be to have the majority of the keys at about elbow height of the operator. One could look at an operator and determine in the side-view whether the keyboard is about at that angle. If one does not know who might be the potential operators, one would have to take a measurement about adjustment ranges and compare this with different elbow measurements.

THE COURT:

Were measurements taken -- are measurements -- strike that. Would the measurement analysis be applied to Concern No. 5, keyboard use?

THE WITNESS:

Yes and no.

THE COURT:

Okay.

THE WITNESS:

There is a yes and no answer. There's some general [*50] keyboard use issues, such as does the person hold their [sic] wrists straight and as grandmother always suggested, and she was right.

So some of these are clearly identifiable by pure observation.